

PREPARATION OF CROSSLINKED RESIN PARTICLE

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- **European:**

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Abstract of JP 11189607 (A)

PROBLEM TO BE SOLVED: To obtain crosslinked resin particles easily by uniformly mixing a polymer having a specified molecular weight and having reactive functional groups except radically reactive groups with a vinyl monomer and a graft crosslinking agent having a radically reactive group reactive with the reactive functional groups of the polymer, emulsifying the resulting mixture in an aqueous medium, and polymerizing the emulsion in the presence of a radical polymerization initiator.

SOLUTION: The polymer used has a number-average molecular weight of 250-1,000,000. The emulsification is performed in the presence of an emulsifier. The polymer is desirably the one in which the main skeleton is a polyisobutylene, an ethylene copolymer, a polypropylene glycol, a polytetramethylene glycol, a polydimethylsiloxane, or a polysulfide. It is also possible to use a crosslinking monomer having at least two radically reactive groups in order to increase the gel content. According to this process, there is no limitation on the type of the monomer used, and, for example, even a monomer incapable of emulsion polymerization can be easily polymerized into a crosslinked polymer.

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Reference 1

Partial Translation

JP Patent Appln. Disclosure No. 11-189607 - 13 July 1999

JP Patent Appln. No. 09-361139 - 26 December 1997

Applicant: Kanegafuchi Kagaku Kogyo K.K., Osaka, JP

Title: Process for producing crosslinked resin particles

Claims

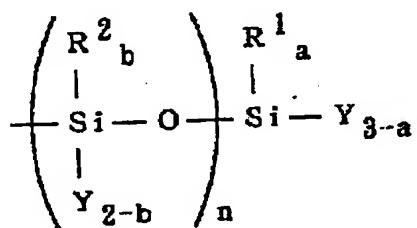
1. Process for producing crosslinked resin particles, whereby: (A) a polymer with a number average molecular weight of 250 to 1,000,000 having reactive functional groups except radically reactive functional groups in its molecule; (B) a vinyl-based monomer; and (C) a graft-crosslinking agent having functional groups reactive with the reactive functional groups contained in the polymer (A) and a radically-reactive group in the molecule thereof are homogeneously mixed, the obtained mixture is emulsified in the presence of an emulsifier in an aqueous solvent, and the reaction of the reactive functional groups contained in the polymer (A) and the polymerization reaction of the vinyl-based monomer (B) by radical-polymerization initiator are carried out.

2. Process for producing crosslinked resin particles, whereby: (A) a polymer with a number average molecular weight of 250 to 1,000,000 having reactive functional groups except radically reactive functional groups in its molecule; (B) a vinyl-based monomer; and (C) a graft-crosslinking agent having functional groups reactive with the reactive functional groups contained in the polymer (A) and a radically-reactive group in the molecule thereof; and (D) a

crosslinkable monomer having two or more radically reactive groups in its molecule, are homogeneously mixed, the obtained mixture is emulsified in the presence of an emulsifier in an aqueous solvent, and the reaction of the reactive functional groups contained in the polymer (A) and the polymerization reaction of the vinyl-based monomer (B) by radical-polymerization initiator are carried out.

3. The process for producing crosslinked resin particles according to claim 1 or 2, wherein the polymer (A) has at least one polymer selected from the group consisting of polyisobutylene, ethylene-based copolymer, polypropylene glycol, polytetramethylene glycol, polydimethylsiloxane and polysulfide, as a main chain skeleton.

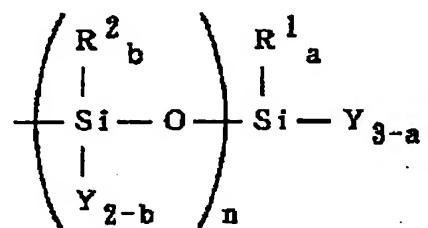
4. The process for producing crosslinked resin particles according to any one of claims 1 to 3, wherein the reactive functional group contained in the polymer (A) is at least one selected from the group consisting of epoxy-, amino-, cyano-, isocyano-, cyanate-, isocyanate-, carboxyl-, acid anhydride-, hydroxyl- and oxazolyl groups and silicon-containing groups represented by the general formula (I):



(wherein R^1 and R^2 are C_{1-20} hydrocarbon- or triorganosiloxy groups, R^1 and R^2 may be identical or different. Y is a hydroxyl group or a hydrolyzable group, and in the case where 2 or more of Y are bonded, they may be identical or different. a is an integer of 0 to 3, b is an integer of 0 to 2 and n is an integer of 0 to 18).

5. The process for producing crosslinked resin particles according to any one of claims 1 to 4, wherein the vinyl-based monomer (B) is at least one selected from the group consisting of ester acrylate, ester methacrylate, aromatic alkenyl compounds and vinyl cyanide compounds.

6. The process for producing crosslinked resin particles according to any one of claims 1 to 5, wherein the functional group reactive with the reactive functional group contained in the polymer (A) in the graft-polymerizing agent (C) is at least one reactive functional group selected from the group consisting of epoxy-, amino-, cyano-, isocyano-, cyanate-, isocyanate-, carboxyl-, acid anhydride-, hydroxyl- and oxazolyl groups and silicon-containing groups represented by the general formula (I):



(wherein R^1 and R^2 are C_{1-20} hydrocarbon- or triorganosiloxy groups, R^1 and R^2 may be identical or different. Y is a hydroxyl group or

a hydrolyzable group, and in the case where 2 or more of Y are bonded, they may be identical or different. a is an integer of 0 to 3, b is an integer of 0 to 2 and n is an integer of 0 to 18), and the radically reactive group is at least one selected from the group consisting of allyl-, vinyl-, isopropenyl-, allyloxy-, acryloyl-, methacryloyl- and mercapto groups.

7. The process for producing crosslinked resin particles according to any one of claims 1 to 6, wherein the radically reactive group contained in the crosslinkable monomer (D) is selected from the group consisting of allyl-, vinyl-, isopropenyl-, allyloxy-, acryloyl-, methacryloyl- and mercapto groups.

8. The process for producing crosslinked resin particles according to any one of claims 1 to 7, wherein the crosslinked resin particles have a mean particle diameter of 0.05 to 10 μm .

[Detailed description of the invention]

[0001]

[Technical field of the invention] The present invention relates to a process for producing crosslinked resin particles. More closely, the present invention relates to a process for producing crosslinked resin particles by which crosslinked resin particles used, for example, as impact resistance improver can be produced in disregard of the kind of monomers.

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